

NFPA®

1977

Standard on
Protective Clothing and Equipment
for Wildland Fire Fighting and Urban
Interface Fire Fighting

2022



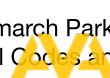
NFPA® 1977

Standard on Protective Clothing and Equipment for Wildland Fire Fighting and Urban Interface Fire Fighting

2022 Edition



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NFPA® 1977

Standard on

Protective Clothing and Equipment for Wildland Fire Fighting and Urban Interface Fire Fighting

2022 Edition

This edition of NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting and Urban Interface Fire Fighting*, was prepared by the Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment and released by the Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment. It was issued by the Standards Council on March 18, 2021, with an effective date of April 8, 2021, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See “Codes & Standards” at www.nfpa.org for more information.

This edition of NFPA 1977 was approved as an American National Standard on April 8, 2021.

Origin and Development of NFPA 1977

The Technical Committee on Fire Service Protective Clothing and Equipment began work on this standard in April 1989 in answer to requests from the wildland fire service to establish a standard covering the protective clothing and equipment used by fire fighters during wildland fire-fighting operations. The Subcommittee on Wildland Fire Fighting Protective Clothing and Equipment was formed to develop the document. Based on information studied by this subcommittee, the majority of documented injuries to wildland fire fighters are related to heat stress. The goal of this standard was to provide thermal protection for the wildland fire fighter against external heat sources with flame-resistant clothing and equipment while not inducing an extraordinary internal heat stress load.

The protection package encompassed by this standard consists of protective clothing and equipment for normal exposure limits and an emergency fire shelter for severe exposure situations in which serious injury or death can result.

The developmental work for the first edition was completed by the subcommittee in the spring of 1992 and presented to the Technical Committee for its action. The first edition of NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, was presented at the Annual Meeting in Orlando, FL, and issued with an effective date of August 20, 1993.

The entire project for fire service protective clothing and equipment was reorganized by the Standards Council in January 1995. The new project had a Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment and seven technical committees operating within the project. The former standing Subcommittee on Wildland Fire Fighting Protective Clothing and Equipment was changed to the new Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment and was responsible for the 1998 edition of NFPA 1977.

The second edition of NFPA 1977 was presented to the NFPA membership at the 1998 Annual Meeting in Cincinnati, Ohio, on May 20, 1998, and was issued by the Standards Council with an effective date of August 5, 1998.

The 2005 edition (third edition) of 1977 was a complete revision and was reformatted according to the new style for all NFPA codes and standards. Because of the new style, most of the chapter numbering and titles, as well as paragraph numbering changed. While the 2005 edition's content was in a different order than in previous editions, all the material remained. The Committee included in Chapter 4 new requirements for manufacturers' quality assurance programs and for hazardous situations involving compliant products. The requirements for these situations included the appropriate actions to take if there is a previously unknown threat to the users. These requirements apply to all fire and emergency services product standards that are the responsibility of this project.

The 2005 edition also added items of wildland fire fighting protective clothing and equipment not addressed in previous editions, such as cold weather outerwear, chain saw protectors, load-carrying equipment, and goggles. Visibility enhancement for items of wildland firefighting protective clothing and equipment was added as a nonmandatory option should purchasers choose to specify such enhancements in the purchase specifications. The requirements for face protection accessories and all other accessories, and for fire shelters were deleted. All labeling, design, performance, and testing requirements were reviewed and refined as necessary.

The 2011 edition featured the addition of new tables on total surface area of all reinforcements. The tables on minimum sizing requirements for protective upper and lower torso garments and one-piece garments were revised. Also, new annex sections explaining heat and thermal shrinkage tests using temperatures less than 260°C were added.

The 2016 edition featured editorial changes throughout the document, including updates and title changes to the referenced documents in Chapter 2. Technical changes related to the hand measurement procedure were provided to be consistent with the requirements of NFPA 1951, *Standard on Protective Ensembles for Technical Rescue Incidents*, and NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. The technical committee clarified what is meant by stitching failure and revised performance requirements for sewing thread. The committee also revised the requirements for testing and wash cycles and corrected cross-references for sample conditioning.

The 2022 edition incorporates within its scope the design requirements of urban interface fire fighting protective clothing. Requirements for personal protective fire shelter design and testing were added. Adjustments have been made to work glove sizing that reflect NFPA 1999 work glove requirements related to digit circumference for consistency, which include specific requirements for glove sizes based on hand length and circumference ranges. Also, test methods for garment material composites have been added. Other revisions in the 2022 edition include an update to the table on minimum sizing requirements for protective lower torso garments for females, as well as a new annex that provides a description of performance requirements and test methods.

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Committee Scope: This Committee shall have primary responsibility for documents on the design, performance, testing, and certification of protective clothing and protective equipment manufactured for fire and emergency services organizations and personnel, to protect against exposures encountered during emergency incident operations. This Committee shall also have the primary responsibility for documents on the selection, care, and maintenance of such protective clothing and protective equipment by fire and emergency services organizations and personnel.

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Protective Clothing and Equipment for Wildland Fire Fighting and Urban Interface Fire Fighting

2022 Edition

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Chapter 1 Administration

1.1 Scope.

1.1.1 This standard shall specify the minimum design, performance, testing, and certification requirements for items of wildland fire fighting and urban interface fire fighting protective clothing and equipment, including protective garments, protective helmets, protective gloves, protective footwear, protective goggles, and protective chain saw protectors; and for load-carrying equipment.

1.1.2 This standard shall specify requirements for any accessories or enhancements built into, attached to, or sold with the certified wildland fire fighting and urban interface fire fighting protective clothing and equipment and for load-carrying equipment by the product manufacturer for later attachment and shall be tested with the wildland fire fighting and urban interface fire fighting protective clothing and equipment and for

load-carrying equipment with those accessories and enhancements installed or attached, as specified in 4.3.13.

1.1.3* This standard shall not be interpreted as providing criteria for respiratory protection for wildland fire fighting and urban interface fire fighting operations as wildland fire fighting and urban interface fire fighting respiratory protection equipment is specified in NFPA 1984.

1.1.4 This standard alone shall not be interpreted as providing criteria for protective clothing or equipment for structural fire fighting operations.

1.1.5 This standard shall not be construed as addressing all safety concerns, if any, associated with its use. It shall be the responsibility of the persons and organizations that use this standard to establish safety and health practices and to determine the applicability of regulatory limitations prior to use of this standard.

1.1.6 Certification of wildland fire fighting and urban interface fire fighting protective clothing and equipment to the requirements of this standard shall not preclude certification to additional appropriate standards where the protective clothing or equipment meet all applicable requirements of each standard.

1.1.7 This standard shall not be construed as addressing all of the safety concerns associated with the use of compliant respirators. It shall be the responsibility of the persons and organizations that use compliant respirators to establish safety and health practices and to determine the applicability of regulatory limitations prior to use.

1.1.8 This standard shall not be construed as addressing all of the safety concerns, if any, associated with the use of this standard by testing facilities. It shall be the responsibility of the persons and organizations that use this standard to conduct testing of respirators to establish safety and health practices and to determine the applicability of regulatory limitations prior to using this standard for any designing, manufacturing, and testing.

1.1.9 Nothing herein shall be construed to restrict any jurisdiction or manufacturer from exceeding these minimum requirements.

1.2 Purpose.

1.2.1* The purpose of this standard shall be to establish a minimum level of protection against the adverse environmental effects encountered by personnel performing wildland fire fighting and urban interface fire fighting operations.

1.2.2 To achieve this purpose, this standard shall establish minimum requirements for wildland fire fighting and urban interface fire fighting protective garments, helmets, gloves, footwear, goggles, chain saw protectors, and load-carrying equipment used by fire fighters during wildland fire fighting and urban interface fire fighting operations.

1.2.3* Controlled laboratory tests used to determine compliance with the performance requirements of this standard shall not be deemed as establishing performance levels for all situations to which wildland fire fighting and urban interface fire fighting personnel can be exposed.

1.2.4 This standard shall not be interpreted or used as a detailed manufacturing or purchase specification but shall be

permitted to be referenced in purchase specifications as minimum requirements.

1.3 Application.

1.3.1 This standard shall apply to the design, manufacturing, and certification of new wildland fire fighting and urban interface fire fighting protective clothing and equipment and new wildland fire fighting and urban interface fire fighting load-carrying equipment.

1.3.2 This standard shall apply to any accessories or enhancements built into, attached to, or sold with the certified new wildland fire fighting and urban interface fire fighting protective clothing and equipment and for new wildland fire fighting and urban interface fire fighting load-carrying equipment by the product manufacturer for later attachment and shall be tested with the wildland fire fighting and urban interface fire fighting respirator with those accessories and enhancements installed or attached, as specified in 4.3.13.

1.3.3 This edition of NFPA 1977 shall not apply to wildland fire fighting and urban interface fire fighting protective clothing and equipment and wildland fire fighting and urban interface fire fighting load-carrying equipment manufactured to previous editions of this standard.

1.3.4 This standard shall not apply to any wildland and urban interface protective clothing and equipment or wildland fire fighting and urban interface fire fighting load-carrying equipment manufactured to the requirements of any other organization's standards.

1.3.5* This standard shall not apply to respiratory protection for personnel during wildland fire fighting and urban interface fire fighting operations.

Δ 1.3.6 This standard shall apply to fire shelters for use by fire fighters during wildland and urban interface fire entrapment situations.

1.3.7 This standard alone shall not apply to protection for structural fire fighting operations performed during wildland and urban interface fire incidents.

1.3.8 This standard alone shall not apply to protection from hazards and adverse environmental effects of emergency medical services (EMS), hazardous materials, and technical rescue operations.

1.3.9 This standard alone shall not apply to protection for terrorism incidents from chemical, biological, radiological, and nuclear (CBRN) agents.

1.3.10 This standard shall not apply to the use of wildland fire fighting and urban interface fire fighting protective clothing and equipment and wildland fire fighting and urban interface fire fighting load-carrying equipment as such use requirements are specified in NFPA 1500.

1.4 Units.

1.4.1 In this standard, values for measurement are followed by an equivalent in parentheses, but only the first stated value shall be regarded as the requirement.

1.4.2 Equivalent values in parentheses shall not be considered as the requirement, because these values are approximate.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471, www.nfpa.org.

NFPA 1500™, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2021 edition.

NFPA 1984, *Standard on Respirators for Wildland Fire-Fighting Operations and Wildland Urban Interface Operations*, 2022 edition.

2.3 Other Publications.

Δ 2.3.1 AATCC Publications. American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709. www.aatcc.org

AATCC TM 135, *Dimensional Changes of Fabrics After Home Laundering*, 2004.

Δ 2.3.2 AIA Publications. Aerospace Industries Association, 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928. www.aia-aerospace.org

NASM 27980, *Fastener, Snap, Style 2* (Regular Wire Spring Clamp Type), 2015.

Δ 2.3.3 ANSI/ISEA Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036. www.ansi.org

ANSI/ISEA Z87.1, *Occupational and Educational Personal Eye and Face Protection Devices*, 2015.

ANSI/ISEA Z89.1, *Industrial Head Protection*, 2014.

Δ 2.3.4 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2018.

ASTM B152/B152M, *Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar*, 2013.

ASTM D1424, *Standard Test Method for the Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus*, 2009, reapproved 2013, editorial change 1, 2015.

ASTM D1683/D1683M, *Standard Test Method for Failure in Sewn Seams of Woven Fabrics*, 2017, reapproved 2018.

ASTM D1776/D1776M, *Standard Practice for Conditioning and Testing Textiles*, 2016.

ASTM D1777, *Standard Test Method for Thickness of Textile Materials*, 1996, reapproved 2015.

ASTM D2256/D2256M, *Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method*, 2010, reapproved 2015.

ASTM D3787, *Standard Test Method for Bursting Strength of Textiles — Constant-Rate-of-Traverse (CRT) Ball Burst Test*, 2016.

ASTM D4966, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)*, 2012, reapproved 2016.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2009, reapproved 2017.

ASTM D5587, *Standard Test Method for Tearing Strength of Fabrics by Trapezoid Procedure*, 2015.

ASTM D6413/D6413M, *Standard Test Method for Flame Resistance of Textiles (Vertical Test)*, 2015.

ASTM D3786M, *Standard Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method*, 2017.

ASTM D7138, *Standard Test Method to Determine Melting Temperature of Synthetic Fibers*, 2016.

ASTM E809, *Standard Practice for Measuring Photometric Characteristics of Retroreflectors*, 2008, reapproved 2013.

ASTM E810, *Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting Utilizing the Coplanar Geometry*, 2003, reapproved 2013.

ASTM F1060, *Standard Test Method for Evaluation of Conductive and Compressive Heat Resistance (CCHR)*, 2018.

ASTM F1342/F1342M, *Standard Test Method for Protective Clothing Material Resistance to Puncture*, 2005, reapproved 2013, e1.

ASTM F1414, *Standard Test Method for Measurement of Cut Resistance to Chain Saw in Lower Body (Legs) Protective Clothing*, 2015.

ASTM F1790, *Standard Test Method for Measuring Cut Resistance of Materials Used in Protective Clothing*, 2005.

ASTM F1868, *Standard Test Method for Thermal and Evaporative Resistance of Clothing Materials Using a Sweating Hot Plate*, 2017.

ASTM F1897, *Standard Specification for Leg Protection for Chain Saw Users*, 2014.

ASTM F1939, *Standard Test Method for Radiant Heat Resistance of Flame Resistant Clothing Materials with Continuous Heating*, 2015.

ASTM F2010/F2010M, *Standard Test Method for Evaluation of Glove Effects on Weaver Finger Dexterity Using a Modified Pegboard Test*, 2018.

ASTM F2299/F2299M, *Standard Test Method for Determining the Initial Efficiency of Materials Used in Medical Face Masks to Penetration by Particulates Using Latex Spheres*, 2003, reapproved 2017.

ASTM F2894, *Standard Test Method for Evaluation of Materials, Protective Clothing and Equipment for Heat Resistance Using a Hot Air Circulating Oven*, 2019.

ASTM F2913, *Standard Test Method for Measuring the Coefficient of Friction for Evaluation of Slip Performance of Footwear and Test Surfaces/Flooring Using a Whole Shoe Tester*, 2019.

▲ **2.3.5 BSI Publications.** British Standards Institution, 389 Chiswick High Road, London, W4 4AL, UK. www.bsigroup.com/en/

BS EN ISO 20471, *High Visibility Clothing — Test Methods and Requirements*, 2013, amendment 1, 2016. (Supersedes EN 471)

■ **2.3.6 CAN/CGSB Publications.** Canadian General Standards Board, Public Works and Government Services Canada, 11 Laurier Street, Phase III, Place du Portage, Gatineau, QC K1A 0S5, Canada. www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html

CAN/CGSB-4.2 No. 27.10, *Flame Resistance—Vertically Oriented Textile Fabric or Fabric Assembly Test*, 2000 (R2011).

CAN/CGSB-4.2 No. 32.2-M89, *Breaking Strength of Seams in Woven Fabrics*, 1997.

▲ **2.3.7 ISO Publications.** International Organization for Standardization, ISO Central Secretariat, BIBC 11, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

ISO Guide 27, *Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity*, 1983.

ISO 4649, *Rubber vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*, 2017.

ISO 9001, *Quality management systems — requirements*, 2015.

ISO 9151, *Protective clothing against heat and flame — Determination of heat transmission on exposure to flame*, 2016.

ISO/IEC 17011, *Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies*, 2017.

ISO/IEC 17021-1, *Conformity assessment — Requirements for bodies audit and certification of management systems — Part 1: Requirements*, 2015.

ISO 17025, *General requirements for the competence of testing and calibration laboratories*, 2017.

ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*, 2012.

ISO 17492, *Clothing for protection against heat and flame — determination of heat transmission on exposure to both flame and radiant heat*, 2003, technical corrigendum 1, 2004.

2.3.8 US Government Publications. US Government Publishing Office, 732 North Capitol Street NW, Washington DC, 20401-0001. www.ecfr.gov

Title 29, Code of Federal Regulations, Part 1910.132, “Personal Protective Equipment,” 2009.

▲ **2.3.9 US Government Publications – Military Specifications and Commercial Item Descriptions.** DLA Document Production Service Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. <http://quicksearch.dla.mil>

Commercial Item Description A-A-55126B, *Fastener Tapes, Hook and Loop, Synthetic*, 7 September 2006.

Commercial Item Description A-A-55195, *Thread, Para-Aramid, Spun, Intermediate Modulus*, 7 April 1993.

Commercial Item Description A-A-55217B, *Thread, Aramid, Spun Staple*, March 2011.

Commercial Item Description A-A-55634B, *Zipppers (Fasteners, Slide Interlocking)*, 9 August 2018.

Military Specification MIL-DTL-10884H, *Fastener, Snap*, 20 July 2005.

2.3.10 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections. (Reserved)

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3* General Definitions.

3.3.1 Brim. A part of the shell of the helmet extending around the entire circumference of the helmet.

3.3.2 Certification/Certified. A system whereby a certification organization determines that a manufacturer has demonstrated the ability to produce a product that complies with the requirements of this standard, authorizes the manufacturer to use a label on listed products that comply with the requirements of this standard, and establishes a follow-up program conducted by the certification organization as a check on the methods the manufacturer uses to determine continued compliance of labeled and listed products with the requirements of this standard.

3.3.3 Certification Organization. An independent, third-party organization that determines product compliance with the requirements of this standard using product testing and evaluation, and administers a labeling/listing/follow-up program.

3.3.4 Chain Saw Protectors. See 3.3.83.

3.3.5 Char. The formation of a brittle residue where the material is exposed to thermal energy.

3.3.6 Chin Strap. An adjustable strap for the helmet that fits under or around the chin to secure the helmet to the head.

3.3.7 Cold Weather Outerwear. See 3.3.86.

3.3.8 Compliance/Compliant. Meeting or exceeding all applicable requirements of this standard.

3.3.9 Component. Any material, part, or subassembly used in the construction of the compliant product.

3.3.10 Composite. The layer or layers of materials or components.

3.3.11 Drip. To run or fall in drops or blobs.

3.3.12 Ease. The size requirements and tolerance of garments that allows good fit and do not inhibit the natural body movements or the performance of job-related tasks.

3.3.13 Face/Neck Shroud. See 3.3.88.

N 3.3.14 Fire Shelter. Equipment used to cover a wildland and urban interface fire fighter during a fire entrapment situation only.

N 3.3.15 Fire Shelter Package. The packaging around the fire shelter that compresses the equipment for ease in carrying.

3.3.16 Flame Resistance (protective apparel). The property of a material whereby combustion is prevented, terminated, or inhibited following application of a flaming or non-flaming source of ignition, with or without subsequent removal of the ignition source. Flame resistance can be an inherent property of a material, or it can be imparted by specific treatment. (See also 3.3.31.)

3.3.17 Fluorescence. A process by which radiant flux of certain wavelengths is absorbed and reradiated non-thermally in other, usually longer, wavelengths.

3.3.18 Follow-Up Program. The sampling, inspections, tests, or other measures conducted by the certification organization on a periodic basis to determine the continued compliance of labeled and listed products that are being produced by the manufacturer to the requirements of this standard.

3.3.19 Footwear. See 3.3.89.

3.3.20 Footwear Upper. That portion of the footwear element above the sole, heel, and insole.

3.3.21 Garment. See 3.3.90, Wildland Fire Fighting and Urban Interface Fire Fighting Protective Garments.

3.3.22 Glove Body. The part of the glove that extends from the tip of the fingers to the wrist crease, or a specified distance beyond the wrist crease.

3.3.23 Gloves. See 3.3.87.

3.3.24 Goggle Clip. The component of the helmet that retains the strap of the goggle or headlamp.

3.3.25* Goggles. See 3.3.91.

3.3.26* Gusset. The relatively flexible material in protective footwear that joins the upper quarter and the tongue to provide expansion when donned.

3.3.27 Hardware. Nonfabric components of the protective clothing and equipment including, but not limited to, those made of metal or plastic.

3.3.28 Headform. A device that simulates the configuration of the human head.

3.3.29 Heel Breast. The forward face of the footwear heel.

3.3.30 Helmet. See 3.3.92.

3.3.31 Inherent Flame Resistance. Flame resistance that is derived from the essential characteristics of the fiber or polymer.

3.3.32 Insole. The inner component of the footwear upon which the foot rests.

3.3.33 Interlining. Any textile that is incorporated into any garment as a layer between the outer and inner layers.

3.3.34 Jacket. See 3.3.93.

3.3.35 Lining. Any material that is used to cover or partially cover the inside surface area of a protective garment.

3.3.36 Load-Carrying Equipment. See 3.3.84.

3.3.37 Lower Torso. The area of the body trunk below the waist, excluding the legs, ankles, and feet.

▲ 3.3.38 Manufacturer. The entity that assumes the liability for the compliant product.

N 3.3.39 Manufacturing Facility. A facility that is involved in the production, or assembly, or final inspection, or labeling of the compliant end product.

3.3.40 Melt. A response to heat by a material resulting in evidence of flowing or dripping.

3.3.41 Nape Device. A component used to aid in helmet retention.

3.3.42 Neck Shroud. See 3.3.88.

3.3.43 One-Piece Garment. See 3.3.94.

N 3.3.44 Padding. Nontextile material that is used to provide impact resistance in load-bearing areas, including but not limited to knees, elbows, and shoulders.

3.3.45 Peak. The part of the helmet extending forward over the wearer's forehead.

3.3.46* Product Label. A marking provided by the manufacturer for each compliant product containing compliance statements, certification statements, manufacturer and model information, or similar data.

3.3.47 Protective Clothing and Equipment. See 3.3.85.

3.3.48 Protective Cold Weather Outerwear. See 3.3.86.

3.3.49 Protective Driving Gloves. See 3.3.87.

3.3.50 Protective Face/Neck Shroud. See 3.3.88.

3.3.51 Protective Footwear. See 3.3.89.

3.3.52 Protective Garments. See 3.3.90.

3.3.53 Protective Goggles. See 3.3.91.

3.3.54 Protective Helmet. See 3.3.92.

3.3.55 Protective Jacket. See 3.3.93.

3.3.56 Protective One-Piece Garment. See 3.3.94.

3.3.57 Protective Shirt. See 3.3.95.

3.3.58 Protective Trousers. See 3.3.96.

3.3.59 Protective Work Gloves. See 3.3.97.

3.3.60 Proximity Fire Fighting. Specialized fire-fighting operations that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of radiant heat as well as conductive and convective heat.

3.3.61 Radiant Protective Performance (RPP). A numerical value indicating the resistance of materials to a radiant heat exposure.

N 3.3.62 Reinforcement. Coated or noncoated textile material that is used to provide additional strength in high-wear or load-bearing areas, including but not limited to pockets, cuffs, knees, elbows, and shoulders.

3.3.63 Retroreflection/Retroreflective. The reflection of light in which the reflected rays are preferentially returned in the direction close to the opposite of the direction of the incident rays, with this property being maintained over wide variations of the direction of the incident rays.

3.3.64 Sample. (1) The ensemble, element, item, component, or composite that is conditioned for testing. (*See also 3.3.70, Specimen.*) (2) Ensembles, elements, items, or components that are randomly selected from the manufacturing facility's production line, from the manufacturer or manufacturer's facility inventory, or from the open market.

3.3.65 Seams.

3.3.65.1* Major Seam. Seam assemblies where rupture exposes the wearer to immediate danger.

3.3.65.2* Minor Seam. Remaining seam assemblies that are not classified as major seams.

3.3.65.3 Seam Assembly. The structure obtained when materials are joined by means of a seam.

3.3.66 Separate/Separation. A material response evidenced by splitting or delaminating.

3.3.67 Shank. The component of footwear that provides additional support to the instep.

3.3.68 Shirt. See 3.3.95.

3.3.69 Shroud. See 3.3.88.

3.3.70 Specimen. The conditioned ensemble, element, item, or component that is tested. Specimens are taken from samples. (See also 3.3.64.)

3.3.71 Structural Fire Fighting. The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation.

3.3.72* Tex. A direct yarn size system that identifies the weight in grams for 1000 meters of yarn.

3.3.73 Textile Fabric. A planar structure consisting of yarns or fibers.

3.3.74 Thermal Protective Performance (TPP). A numerical value indicating the resistance of materials to a convective and radiant heat exposure.

3.3.75* Tongue. The part of the protective footwear that is provided for lace up protective footwear with a closure that extends from the vamp to the top line of the footwear between sides of the footwear upper and is exposed to the exterior environment when the footwear is correctly donned.

3.3.76 Top Line. The top edge of protective footwear that includes the tongue, gusset, quarter, collar, and shaft.

3.3.77 Trim. See 3.3.81.

3.3.78 Trousers. See 3.3.96.

3.3.79 Upper Torso. The area of the body trunk above the waist and extending to the shoulder, excluding the arms, wrists, and hands.

N 3.3.80 Urban Interface Fire Fighting. Activities of fire suppression and property conservation within areas of housing or other structures/improvements that are either intermingled or abut vegetation or forest.

3.3.81 Visibility Markings. Retroreflective and fluorescent conspicuity enhancements. Retroreflective enhancements improve night time conspicuity, and fluorescent enhancements improve day time conspicuity.

3.3.82 Wildland Fire Fighting. The activities of fire suppression and property conservation in woodlands, forests, grasslands, brush, prairies, and other such vegetation, or any combination of vegetation, that is involved in a fire situation but is not within buildings or structures.

3.3.83 Wildland Fire Fighting and Urban Interface Fire Fighting Chain Saw Protectors. The items of protective equipment that provide protection to the legs, or to the lower torso and legs, excluding the ankles and feet.

3.3.84 Wildland Fire Fighting and Urban Interface Fire Fighting Load-Carrying Equipment. The item of equipment worn by the wildland and urban interface fire fighter to facilitate the carrying of gear.

3.3.85* Wildland Fire Fighting and Urban Interface Fire Fighting Protective Clothing and Equipment. Items of compliant protective clothing and equipment products that provide protection from some risks, but not all risks, of emergency incident operations.

3.3.86 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Cold Weather Outerwear. Items of protective clothing that provide protection to the upper or lower torso, arms, and legs to provide insulation for warmth of the wearer during cold weather.

3.3.87 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Driving Gloves. The items of protective clothing that provide protection to the hands and wrists, and dexterity and grip to the hands that is critical to operating fire fighting vehicles and special equipment during wildland fire fighting and urban interface fire fighting operations.

3.3.88 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Face/Neck Shroud. Items of protective clothing that provide protection to the face and neck area.

3.3.89 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Footwear. Items of protective clothing that provide protection to the foot, ankle, and lower leg.

3.3.90* Wildland Fire Fighting and Urban Interface Fire Fighting Protective Garments. Items of protective clothing that provide protection to the wearer's upper or lower torso, excluding the hands, face, and feet.

3.3.91* Wildland Fire Fighting and Urban Interface Fire Fighting Protective Goggle. The items of protective equipment that provide protection to the eyes and a portion of the face.

3.3.92 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Helmet. Items of protective equipment that provide protection to the head.

3.3.93 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Jacket. The protective outer garment item that provides protection to the upper torso and arms, excluding the hands and head.

3.3.94 Wildland Fire Fighting and Urban Interface Fire Fighting Protective One-Piece Garment. The single-piece protective garment item that provides protection to the upper and lower torso, arms, and legs, excluding the head, hands, and feet.

3.3.95 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Shirt. A protective garment item that provides protection to the upper torso and arms, excluding the head and hands.

3.3.96 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Trousers. The protective garment items that provide protection to the lower torso and legs, excluding the feet.

3.3.97 Wildland Fire Fighting and Urban Interface Fire Fighting Protective Work Gloves. The items of protective clothing that provide protection to the hands and wrists while directly engaged in wildland fire fighting and urban interface fire fighting operations.

N 3.3.98 Wildland/Urban Interface (WUI). The line or zone where structures and other development meet or intermingle with undeveloped wildland or vegetative fuels and the area

within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire.

N 3.3.99 Wildland/Urban Interface Fire Fighting. See 3.3.80, Urban Interface Fire Fighting and 3.3.82, Wildland Fire Fighting.

3.3.100 Winter Liner. An optional component layer that provides added insulation against cold.

Chapter 4 Certification

4.1 General.

4.1.1 The process of certification for protective clothing and equipment as being compliant with NFPA 1977 shall meet the requirements of Section 4.1 through Section 4.8.

4.1.2 All compliant protective clothing and equipment that are labeled as being compliant with this standard shall meet or exceed all applicable requirements specified in this standard and shall be certified.

4.1.2.1 The wildland fire fighting and urban interface fire fighting protective face/neck shroud shall be certified to the requirements specified in Sections 6.5 and 7.5 with a specific compliant wildland fire fighting and urban interface fire fighting protective helmet or helmets.

Δ 4.1.3 All certification shall be performed by a certification organization that meets at least the requirements specified in Section 4.2 and that is accredited for personal protective equipment in accordance with ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*. The accreditation shall be issued by an accreditation body operating in accordance with ISO/IEC 17011, *Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies*.

4.1.4 Manufacturers shall not claim compliance with portions or segments of the requirements of this standard and shall not use the NFPA name or the name or identification of this standard, NFPA 1977, in any statements about their respective product(s) unless the product(s) is certified as compliant to this standard.

4.1.5 All compliant protective clothing and equipment shall be labeled and listed.

Δ 4.1.6 All compliant protective clothing and equipment shall also have a product label that meets the requirements specified in 5.1.1, 5.2.1, 5.3.1, 5.4.1, 5.5.1, 5.6.1, 5.7.1, 5.8.1, 5.9.1, and 5.10.1.

4.1.7* The certification organization's label, symbol, or identifying mark shall be attached to the product label, or shall be part of the product label, or shall be immediately adjacent to the product label.

4.1.8 The certification organization shall not issue any new certifications to the 2016 edition of this standard on or after the NFPA effective date for the 2022 edition of NFPA 1977.

Δ 4.1.9 The certification organization shall not permit any manufacturer to continue to label any protective clothing and equipment certified as compliant with the 2016 edition of NFPA 1977 on or after the effective date for the 2022 edition, plus 12 months.

4.1.10 The certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 2016 edition of this standard from all protective clothing and equipment that are under the control of the manufacturer on the NFPA effective date, and the certification organization shall verify that this action is taken.

4.2 Certification Program.

4.2.1* The certification organization shall not be owned or controlled by manufacturers or vendors of the product being certified.

4.2.2 The certification organization shall be primarily engaged in certification work and shall not have a monetary interest in the product's ultimate profitability.

Δ 4.2.3 The certification organization shall be accredited for personal protective equipment in accordance with ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services*. The accreditation shall be issued by an accreditation body operating in accordance with ISO/IEC 17011, *Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies*.

4.2.4 The certification organization shall refuse to certify products to this standard that do not comply with all applicable requirements of this standard.

4.2.5* The contractual provisions between the certification organization and the manufacturer shall specify that certification is contingent on compliance with all applicable requirements of this standard.

4.2.5.1 The certification organization shall not offer or confer any conditional, temporary, or partial certifications.

4.2.5.2 Manufacturers shall not be authorized to use any label or reference to the certification organization on products that are not compliant with all applicable requirements of this standard.

4.2.6* The certification organization shall have laboratory facilities and equipment available for conducting proper tests to determine product compliance.

4.2.6.1 The certification organization laboratory facilities shall have a program in place and functioning for calibration of all instruments, and procedures shall be in use to ensure proper control of all testing.

4.2.6.2 The certification organization laboratory facilities shall follow good practice regarding the use of laboratory manuals, form data sheets, documented calibration and calibration routines, performance verification, proficiency testing, and staff qualification and training programs.

4.2.7 The certification organization shall require the manufacturer to establish and maintain a quality assurance program that meets the requirements of Section 4.5.

4.2.7.1* The certification organization shall require the manufacturer to have a product recall system specified in Section 4.8, as part of the manufacturer's quality assurance program.

4.2.7.2 The certification organization shall audit the manufacturer's quality assurance program to ensure that the quality

assurance program provides continued product compliance with this standard.

4.2.8 The certification organization and the manufacturer shall evaluate any changes affecting the form, fit, or function of the compliant product to determine its continued certification to this standard.

4.2.9* The certification organization shall have a follow-up inspection program of the manufacturer's manufacturing facilities of the compliant product with at least two random and unannounced visits per 12-month period to verify the product's continued compliance. Where portions of the production process are carried out by multiple facilities, the certification organization shall determine the appropriate follow-up program according to which facility or facilities most closely meet the definition for manufacturing facility provided in 3.3.39.

4.2.9.1 As part of the follow-up inspection program, the certification organization shall select sample compliant product at random from the manufacturing facility's production line, from the manufacturer's or manufacturing facility's in-house stock, or from the open market.

4.2.9.2 Sample product shall be evaluated by the certification organization to verify the product's continued compliance in order to ensure that the materials, components, and manufacturing quality assurance systems are consistent with the materials, components, and manufacturing quality assurance that were inspected and tested by the certification organization during initial certification and recertification.

4.2.9.3 The certification organization shall be permitted to conduct specific testing to verify the product's continued compliance.

4.2.9.4 For products, components, and materials where prior testing, judgment, and experience of the certification organization have shown results to be in jeopardy of not complying with this standard, the certification organization shall conduct more frequent testing of sample product, components, and materials acquired in accordance with 4.2.9.1 against the applicable requirements of this standard.

4.2.10 The certification organization shall have in place a series of procedures, as specified in Section 4.6, that address report(s) of situation(s) in which a compliant product is subsequently found to be hazardous.

4.2.11 The certification organization's operating procedures shall provide a mechanism for the manufacturer to appeal decisions. The procedures shall include the presentation of information from both sides of a controversy to a designated appeals panel.

4.2.12 The certification organization shall be in a position to use legal means to protect the integrity of its name and label. The name and label shall be registered and legally defended.

4.3 Inspection and Testing.

4.3.1 For both initial certification and recertification of protective clothing and equipment, the certification organization shall conduct both inspection and testing as specified in this section.

4.3.2 All inspections, evaluations, conditioning, and testing for certification or for recertification shall be conducted by a certification organization's testing laboratory that is accredited

in accordance with the requirements of ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*.

4.3.2.1 The certification organization's testing laboratory's scope of accreditation to ISO 17025/IEC, *General requirements for the competence of testing and calibration laboratories*, shall encompass testing of personal protective equipment.

Δ **4.3.2.2** The accreditation of a certification organization's testing laboratory shall be issued by an accreditation body operating in accordance with ISO/IEC 17011, *Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies*.

4.3.3 A certification organization shall be permitted to utilize conditioning and testing results conducted by a product or component manufacturer for certification or recertification provided the manufacturer's testing laboratory meets the requirements specified in 4.3.3.1 through 4.3.3.5.

4.3.3.1 The manufacturer's testing laboratory shall be accredited in accordance with the requirements of ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*.

4.3.3.2 The manufacturer's testing laboratory's scope of accreditation to ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, shall encompass testing of personal protective equipment.

Δ **4.3.3.3** The accreditation of a manufacturer's testing laboratory shall be issued by an accreditation body operating in accordance with ISO/IEC 17011, *Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies*.

4.3.3.4 The certification organization shall approve the manufacturer's testing laboratory.

4.3.3.5 The certification organization shall determine the level of supervision and witnessing of the conditioning and testing for certification or recertification conducted at the manufacturer's testing laboratory.

4.3.4 Sampling levels for testing and inspection shall be established by the certification organization and the manufacturer to ensure a reasonable and acceptable reliability at a reasonable and acceptable confidence level that products certified to this standard are compliant, unless such sampling levels are specified herein.

Δ **4.3.5** Inspection by the certification organization shall include a review of all product labels to ensure that all required label attachments, compliance statements, certification statements, and other product information are at least as specified for the protective clothing and equipment in 5.1.1, 5.2.1, 5.3.1, 5.4.1, 5.5.1, 5.6.1, 5.7.1, 5.8.1, 5.9.1, and 5.10.1.

Δ **4.3.6** Inspection by the certification organization shall include an evaluation of any symbols and pictorial graphic representations used on product labels or in user information, as permitted in 5.1.1.6, 5.2.1.6, 5.3.1.6, 5.4.1.6, 5.5.1.6, 5.6.1.6, 5.7.1.6, 5.8.1.6, 5.9.1.6, and 5.10.1.6, to ensure that the symbols are clearly explained in the product's user information package.

Δ **4.3.7** Inspection by the certification organization shall include a review of the user information required by 5.1.2, 5.2.2, 5.3.2,

5.4.2, 5.5.2, 5.6.2, 5.7.2, 5.8.2, 5.9.2, and 5.10.2 to ensure that the information has been developed and is available.

4.3.8 Inspection and evaluation by the certification organization for determining compliance with the design requirements specified in Chapter 6 shall be performed on whole or complete products.

4.3.9 Testing to determine product compliance with the performance requirements specified in Chapter 7 shall be conducted by the certification organization in accordance with the specified testing requirements of Chapter 8.

4.3.9.1 Testing shall be performed on specimens representative of materials and components used in the actual construction of the protective clothing and equipment.

4.3.9.2 The certification organization also shall be permitted to use sample materials cut from a representative product.

4.3.10 The certification organization shall accept from the manufacturer, for evaluation and testing for certification, only product or product components that are the same in every respect to the actual final product or product component.

4.3.11 The certification organization shall not allow any modifications, pretreatment, conditioning, or other such special processes of the product or any product component prior to the product's submission for evaluation and testing by the certification organization.

4.3.12 The certification organization shall not allow the substitution, repair, or modification, other than as specifically permitted herein, of any product or any product component during testing.

4.3.13 Where there are any accessories, enhancements, or both that are built into, or attachable to, or detachable from wildland fire fighting and urban interface fire fighting protective clothing and equipment and wildland fire fighting and urban interface fire fighting load-carrying equipment by the product manufacturer, the certification organization shall evaluate and inspect the product as specified in Chapter 6 and shall test the product as specified in Chapter 8, and the product shall meet the performance requirements specified in Chapter 7 with those accessories and enhancements installed or attached to ensure the performance and functions of the protective clothing and equipment or the load-carrying equipment.

4.3.14 The certification organization shall not allow test specimens that have been conditioned and tested for one method to be reconditioned and tested for another test method unless specifically permitted in the test method.

4.3.15 Any change in the design, construction, or material of a compliant product shall necessitate new inspection and testing to verify compliance to all applicable requirements of this standard that the certification organization determines can be affected by such change. This recertification shall be conducted before labeling the modified product, accessories, or enhancements certified as being compliant with this standard.

4.3.16 The manufacturer shall maintain all design and performance inspection and test data from the certification organization used in the certification of the manufacturer's compliant product. The manufacturer shall provide such data, upon request, to the purchaser or authority having jurisdiction.

4.4 Annual Verification of Product Compliance.

4.4.1 All protective clothing and equipment labeled as being compliant with this standard shall undergo recertification on an annual basis. This recertification shall include the following:

- (1) Inspection and evaluation to all design requirements as required by this standard on all manufacturer models and components
- (2) Testing to all performance requirements as required by this standard on all manufacturer models and components with the following protocol:
 - (a) Where a test method incorporates testing both before and after the laundering preconditioning specified in 8.1.2 and the test generates quantitative results, recertification testing shall be limited to the conditioning that yielded the worst-case test result during the initial certification for the model or component.
 - (b) Where a test method incorporates testing both before and after laundering preconditioning specified in 8.1.2 and the test generates nonquantitative results (e.g., pass/fail for melt/drip), recertification shall be limited to a single conditioning procedure in any given year. Subsequent annual recertifications shall cycle through the remaining conditioning procedures to ensure that all required conditionings are included over time.
 - (c) Where a test method requires the testing of three specimens, a minimum of one specimen shall be tested for annual recertification. For conductive heat resistance testing of gloves, three specimens shall be tested.
 - (d) Where a test method requires the testing of five or more specimens, a minimum of two specimens shall be tested for annual recertification.

4.4.2 Samples of manufacturer models and components for recertification acquired from the manufacturer or component supplier during random and unannounced visits as part of the follow-up inspection program in accordance with 4.2.9 shall be permitted to be used toward annual recertification.

4.4.2.1 For recertification, the certification organization shall acquire at least one complete item of protective clothing or equipment.

4.4.2.2 The certification organization shall also acquire a sufficient quantity of components to be tested for recertification as required by 4.4.3.

4.4.3 Protective clothing, equipment, and components shall be inspected, evaluated, and tested as specified in 4.4.3.1 and 4.4.3.2.

4.4.3.1 One sample of each protective clothing or equipment item shall be inspected and evaluated to each of the design requirements specified in Chapter 6.

4.4.3.2 One sample of each protective clothing or equipment item or components shall be tested for overall performance as specified in Chapter 7.

4.4.4 The manufacturer shall maintain all design, inspection, performance, and test data from the certification organization produced during the recertification of manufacturer's models and components. The manufacturer shall provide such data,

upon request, to the purchaser or to the authority having jurisdiction.

4.5 Manufacturer's Quality Assurance Program.

4.5.1 The manufacturer shall provide and operate a quality assurance program that meets the requirements of this section and that includes a product recall system as specified in 4.2.7.1 and Section 4.8.

4.5.2 The operation of the quality assurance program shall evaluate and test compliant product production against this standard to ensure that production remains in compliance.

4.5.3 All of the following entities shall either be registered to ISO 9001, *Quality management systems — Requirements*, or shall be listed as a covered location under an ISO 9001 registered entity:

- (1) Manufacturer
- (2) Manufacturing facility
- (3) Entity that directs and controls compliant product design
- (4) Entity that directs and controls compliant product quality assurance
- (5) Entity that provides the warranty for the compliant product
- (6) Entity that puts its name on the product label and markets and sells the product as its own

4.5.3.1 Registration to the requirements of ISO 9001, *Quality management systems—requirements*, shall be conducted by a registrar that is accredited for personal protective equipment in accordance with ISO/IEC 17021-1, *Conformity assessment — Requirements for bodies audit and certification of management systems — Part 1: Requirements*. The registrar shall affix the accreditation mark on the ISO registration certificate.

4.5.3.2 The scope of the ISO registration shall include at least the design and manufacturing systems management for the type of personal protective equipment being certified.

4.5.4* Where the manufacturer uses subcontractors in the construction or assembly of the compliant product, the locations and names of all subcontractor facilities shall be documented and the documentation shall be provided to the manufacturer's ISO registrar and the certification organization.

4.5.5 Where manufacturers make custom-sized or specially fitted gloves for accommodating the special needs of individual firefighters, the manufacturer shall employ the same manufacturing methods as used for making required glove sizes.

4.5.5.1 The manufacturer shall notify the certification organization as required in 4.2.8 and shall obtain written approval from the certification organization prior to proceeding with any modifications to an existing certified glove design.

4.5.5.2 Where gloves are provided with a moisture barrier, custom-fitting gloves shall be individually evaluated to verify the integrity of the glove moisture barrier using air or other similar method to ensure that the glove is constructed in a leak-free manner.

4.6 Hazards Involving Compliant Product.

4.6.1* The certification organization shall establish procedures to be followed where situation(s) are reported in which a compliant product is subsequently found to be hazardous. These procedures shall comply with the provisions of ISO Guide 27, *Guidelines for corrective action to be taken by a certification*

body in the event of misuse of its mark of conformity, and as modified herein.

4.6.2* Where a report of a hazard involved with a compliant product is received by the certification organization, the validity of the report shall be investigated.

4.6.3 With respect to a compliant product, a hazard shall be a condition, or create a situation, that results in exposing life, limb, or property to an imminently dangerous or dangerous condition.

4.6.4 Where a specific hazard is identified, the determination of the appropriate action for the certification organization and the manufacturer to undertake shall take into consideration the severity of the hazard and its consequences to the safety and health of users.

4.6.5 Where it is established that a hazard is involved with a compliant product, the certification organization shall determine the scope of the hazard including products, model numbers, serial numbers, factory production facilities, production runs, and quantities involved.

4.6.6 The certification organization's investigation shall include, but not be limited to, the extent and scope of the problem as it might apply to other compliant product or compliant product components manufactured by other manufacturers or certified by other certification organizations.

4.6.7 The certification organization shall also investigate reports of a hazard where compliant product is gaining widespread use in applications not foreseen when the standard was written, such applications in turn being ones for which the product was not certified, and no specific scope of application has been provided in the standard, and no limiting scope of application was provided by the manufacturer in written material accompanying the compliant product at the point of sale.

4.6.8 The certification organization shall require the manufacturer of the compliant product or of the compliant product component, if applicable, to assist the certification organization in the investigation and to conduct its own investigation as specified in Section 4.7.

4.6.9 Where the facts indicating a need for corrective action are conclusive and the certification organization's appeal procedures referenced in 4.2.11 have been followed, the certification organization shall initiate corrective action immediately, provided there is a manufacturer to be held responsible for such action.

4.6.10 Where the facts are conclusive and corrective action is indicated, but there is no manufacturer to be held responsible, such as when the manufacturer is out of business or the manufacturer is bankrupt, the certification organization shall immediately notify relevant governmental and regulatory agencies and issue a notice to the user community about the hazard.

4.6.11* Where the facts are conclusive and corrective action is indicated, the certification organization shall take one or more of the following corrective actions:

- (1) Notification of parties authorized and responsible for issuing a safety alert when, in the opinion of the certification organization, such a notification is necessary to inform the users.
- (2) Notification of parties authorized and responsible for issuing a product recall when, in the opinion of the certifi-

ication organization, such a recall is necessary to protect the users.

- (3) Removing the mark of certification from the product.
- (4) Where a hazardous condition exists and it is not practical to implement 4.6.11(1), 4.6.11(2), or 4.6.11(3), or the responsible parties refuse to take corrective action, the certification organization shall notify relevant governmental and regulatory agencies and issue a notice to the user community about the hazard.

4.6.12 The certification organization shall provide a report to the organization or responsible individual identifying the reported hazardous condition and notify them of the corrective action indicated, or that no corrective action is indicated.

4.6.13* Where a change to an NFPA standard(s) is felt to be necessary, the certification organization shall also provide a copy of the report and corrective actions indicated to NFPA, and shall also submit either a Public Proposal for a proposed change to the next revision of the applicable standard, or a proposed Tentative Interim Amendment (TIA) to the current edition of the applicable standard.

4.7 Manufacturer's Investigation of Complaints and Returns.

4.7.1 Manufacturers shall provide corrective action in accordance with ISO 9001, *Quality management systems — requirements*, for investigating written complaints and returned products.

4.7.2 Manufacturers' records of returns and complaints related to safety issues shall be retained for at least 5 years.

4.7.3 Where the manufacturer discovers, during the review of specific returns or complaints, that a compliant product or compliant product component can constitute a potential safety risk to end users and is possibly subject to a safety alert or product recall, the manufacturer shall immediately contact the certification organization and provide all information about its review to assist the certification organization with its investigation.

4.8 Manufacturer's Safety Alert and Product Recall Systems.

4.8.1 A manufacturer shall establish a written safety alert system and a written product recall system that describes the procedures to be used in the event that it decides, or is directed by the certification organization, to either issue a safety alert or to conduct a product recall.

4.8.2 The manufacturer's safety alert and product recall system shall provide the following:

- (1) The establishment of a coordinator and responsibilities by the manufacturer for the handling of safety alerts and product recalls
- (2) A method of notifying all dealers, distributors, purchasers, users, and NFPA about the safety alert or product recall that can be initiated within a 1-week period following the manufacturer's decision to issue a safety alert or to conduct a product recall, or after the manufacturer has been directed by the certification organization to issue a safety alert or conduct a product recall
- (3) Techniques for communicating accurately and understandably the nature of the safety alert or product recall and in particular the specific hazard or safety issue found to exist
- (4) Procedures for removing product from the market that is recalled and for documenting the effectiveness of the product recall

- (5) A plan for repairing, replacing, or compensating purchasers for returned product

Chapter 5 Labeling and Information

5.1 Protective Garments.

5.1.1 Product Label Requirements.

5.1.1.1 Each garment shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located inside each garment when the garment is properly assembled with all layers and components in place.

5.1.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.1.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.

5.1.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.1.1.5 All worded portions of the required product label shall be printed at least in English.

5.1.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.1.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING PROTECTIVE GARMENT MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.1.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's garment identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Size, using the garment sizes specified in 6.1.14
- (8) Garment materials and percent content
- (9) Cleaning precautions

5.1.2 User Information.

5.1.2.1 The garment manufacturer shall provide at least the user information that is specified in 5.1.2.5 with each garment.

5.1.2.2 The garment manufacturer shall attach the required user information or packaging containing the user information to the garment in such a manner that it is not possible to use the garment without being aware of the availability of the information.

5.1.2.3 The required user information or packaging containing the user information shall be attached to the garment so that a deliberate action is necessary to remove it. The garment manufacturer shall provide notice that the user information is to be removed **ONLY** by the end user.

5.1.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.1.2.5 The garment manufacturer shall provide at least the following instructions and information with each garment:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Garment marking recommendations and restrictions
 - (d) A statement that most performance properties of the garment cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use garments that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.2 Protective Helmet.

5.2.1 Product Label Requirements.

5.2.1.1 Each helmet shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on or inside each helmet when the helmet is properly assembled with all components in place.

5.2.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.2.1.3 Multiple label pieces shall be permitted in order to carry all the statements and information required to be on the product label.

5.2.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.2.1.5 All worded portions of the required product label shall be printed at least in English.

5.2.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.2.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING PROTECTIVE HELMET MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.2.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's helmet identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Helmet size or size range
- (8) Nominal weight of helmet
- (9) Cleaning precautions

5.2.2 User Information.

5.2.2.1 The helmet manufacturer shall provide at least the user information that is specified in 5.2.2.5 with each helmet.

5.2.2.2 The helmet manufacturer shall attach the required user information or packaging containing the user information to the helmet in such a manner that it is not possible to use the helmet without being aware of the availability of the information.

5.2.2.3 The required user information or packaging containing the user information shall be attached to the helmet so that a deliberate action is necessary to remove it. The helmet manufacturer shall provide notice that the user information is to be removed **ONLY** by the end user.

5.2.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.2.2.5 The helmet manufacturer shall provide at least the following instructions and information with each helmet:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Helmet marking recommendations and restrictions
 - (d) A statement that most performance properties of the helmet cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use helmets that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.3 Protective Work Gloves.

5.3.1 Product Label Requirements.

5.3.1.1 Each protective work glove shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on or inside each work glove when the glove is properly assembled with all components in place.

5.3.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.3.1.3 Multiple label pieces shall be permitted in order to carry all the statements, symbols, and information required to be on the product label.

5.3.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.3.1.5 All worded portions of the required product label shall be printed at least in English.

5.3.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.3.1.7 The following statement shall be printed legibly on the work glove product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING PROTECTIVE WORK GLOVE MEETS THE WORK GLOVE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.3.1.8 At least the following information shall also be printed legibly on the work glove product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's glove identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Glove size or size range
- (8) Cleaning precautions

5.3.2 User Information.

5.3.2.1 The protective work glove manufacturer shall provide at least the user information that is specified in 5.3.2.5 with each work glove pair.

5.3.2.2 The protective work glove manufacturer shall attach the required user information or packaging containing the user information to the work glove pair in such a manner that it is not possible to use the work gloves without being aware of the availability of the information.

5.3.2.3 The required user information or packaging containing the user information shall be attached to the work glove pair so that a deliberate action is necessary to remove it. The protective work glove manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.3.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.3.2.5 The protective work glove manufacturer shall provide at least the following instructions and information with each work glove pair:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Glove marking recommendations and restrictions
 - (d) A statement that most performance properties of the gloves cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500
- (6) Maintenance and cleaning

- (a) Cleaning instructions and precautions with a statement advising users not to use gloves that are not thoroughly cleaned and dried
- (b) Maintenance criteria and methods of repair where applicable
- (7) Retirement and disposal criteria and considerations

5.3.2.6 The protective work glove manufacturer shall make available to prospective purchasers and the purchaser a chart illustrating the hand dimension ranges specified in 6.3.5.

5.4 Protective Footwear.

5.4.1 Product Label Requirements.

5.4.1.1 Each footwear pair shall have a product label or labels permanently and conspicuously attached to each boot half pair. At least one product label shall be conspicuously located on or inside each boot when the boot is properly assembled with all components in place.

5.4.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.4.1.3 Multiple label pieces shall be permitted in order to carry all the statements and information required to be on the product label.

5.4.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.4.1.5 All worded portions of the required product label shall be printed at least in English.

5.4.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.4.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING PROTECTIVE FOOTWEAR MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.4.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's footwear identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Footwear size and width

- (8) Cleaning precautions

5.4.2 User Information.

5.4.2.1 The footwear manufacturer shall provide at least the user information that is specified in 5.4.2.5 with each footwear pair.

5.4.2.2 The footwear manufacturer shall attach the required user information or packaging containing the user information to the boot pair in such a manner that it is not possible to use the boots without being aware of the availability of the information.

5.4.2.3 The required user information or packaging containing the user information shall be attached to the boot pair so that a deliberate action is necessary to remove it. The footwear manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.4.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.4.2.5 The footwear manufacturer shall provide at least the following instructions and information with each footwear pair:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Boot marking recommendations and restrictions
 - (d) A statement that most performance properties of the boots cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use boots that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.4.2.6 Manufacturers shall be required to establish and provide, upon request, a size conversion chart for each model or style of protective footwear based on toe length, arch length, and foot width as measured on the Brannock Scientific Foot Measuring Device.

5.5 Protective Face/Neck Shroud.

5.5.1 Product Label Requirements.

5.5.1.1 Each face/neck shroud shall have a product label or labels permanently and conspicuously attached.

5.5.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.5.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.

5.5.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.5.1.5 All worded portions of the required product label shall be printed at least in English.

5.5.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.5.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING PROTECTIVE FACE/NECK SHROUD MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.5.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's number, lot, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Identification of the compliant helmet(s) with which the face/neck shroud was certified

5.5.2 User Information.

5.5.2.1 The face/neck shroud manufacturer shall provide at least the user information that is specified in 5.5.2.5 with each shroud.

5.5.2.2 The shroud manufacturer shall attach the required user information or packaging containing the user information to the shroud in such a manner that it is not possible to use the shroud without being aware of the availability of the information.

5.5.2.3 The required user information or packaging containing the user information shall be attached to the shroud so that a deliberate action is necessary to remove it. The garment manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.5.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or replace worded

statements or user information where explanations for symbols and pictorial graphic representations are provided.

5.5.2.5 The face/neck shroud manufacturer shall provide at least the following instructions and information with each face/neck shroud.

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Shroud marking recommendations and restrictions
 - (d) A statement that most performance properties of the shroud cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use shrouds that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.5.2.6 The manufacturer shall identify by manufacturer name and model number the helmet(s) with which the face/neck shroud has been certified and include instructions in the user information for how the face/neck shroud is worn with each helmet with which the face/neck shroud is certified.

5.6 Protective Goggles.

5.6.1 Product Label Requirements.

5.6.1.1 Each pair of goggles shall have a product label configured and attached to the goggles so that the product label shall not interfere with the legibility of any printed portion of the label.

5.6.1.2 Product labels shall be permitted to be configured as labels attached to the goggles, tags attached to the goggles, or package labels printed on or attached to the package containing the smallest number of goggles from which the user withdraws a pair of goggles for use.

5.6.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.

5.6.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.6.1.5 All worded portions of the required product labels shall be printed at least in English.

5.6.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.6.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING PROTECTIVE GOGGLE MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.6.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's number, lot, or serial number
- (5) Month and year of manufacture
- (6) Model or style name, number, or design

5.6.1.9 In addition to the goggles product label, each goggles lens shall bear the following:

- (1) The manufacturer's identifying mark or symbol
- (2) The certification organization's label, symbol, or identifying mark
- (3) The statement "NFPA 1977, 2022 Ed." in letters at least 2 mm ($\frac{1}{16}$ in.) high

5.6.1.10 All markings on the goggles lens shall be permanent, legible, and placed so that they do not interfere with the vision of the wearer.

5.6.2 User Information.

5.6.2.1 The goggles manufacturer shall provide at least the user information that is specified in 5.6.2.5 with each pair of goggles.

5.6.2.2 The goggles manufacturer shall attach the required user information or packaging containing the user information to the goggles in such a manner that it is not possible to use the goggles without being aware of the availability of the information.

5.6.2.3 The required user information or packaging containing the user information shall be attached to the goggles so that a deliberate action is necessary to remove it. The goggles manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.6.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or replace worded statements or user information where explanations for symbols and pictorial graphic representations are provided.

5.6.2.5 The goggle manufacturer shall provide at least the following instructions and information with each pair of goggles:

- (1) Pre-use information

- (a) Safety considerations
- (b) Limitations of use
- (c) Recommendations and restrictions
- (d) Warranty information
- (e) A statement that most performance properties of the goggles cannot be tested by the user in the field
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Helmet/goggles interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.7 Chain Saw Protectors.

5.7.1 Product Label Requirements.

5.7.1.1 Each chain saw protector shall have a product label or labels permanently and conspicuously attached.

5.7.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.7.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required.

5.7.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.7.1.5 All worded portions of the required product label shall be printed at least in English.

5.7.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.7.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING CHAIN SAW PROTECTOR MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.7.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Size
- (8) Cleaning precautions

5.7.2 User Information.

5.7.2.1 The chain saw protector manufacturer shall provide at least the user information that is specified in 5.7.2.5 with each chain saw protector.

5.7.2.2 The chain saw protector manufacturer shall attach the required user information or packaging containing the user information to the chain saw protector in such a manner that it is not possible to use it without being aware of the availability of the information.

5.7.2.3 The required user information or packaging containing the user information shall be attached to the chain saw protector so that a deliberate action is necessary to remove it. The chain saw protector manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.7.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.7.2.5 The chain saw protector manufacturer shall provide at least the following instructions and information with each pair of chain saw protectors:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) A statement that most performance properties of the chain saw protective device cannot be tested by the user in the field
 - (d) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
 - (d) Maintenance and cleaning
 - (e) Cleaning instructions and precautions
- (5) Proper use consistent with 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.8 Protective Driving Gloves.

5.8.1 Product Label Requirements.

5.8.1.1 Each protective driving glove shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on or inside each driving glove when the glove is properly assembled with all components in place.

5.8.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.8.1.3 Multiple label pieces shall be permitted in order to carry all the statements, symbols, and information required to be on the product label.

5.8.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.8.1.5 All worded portions of the required product label shall be printed at least in English.

5.8.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.8.1.7 The following statement shall be printed legibly on the driving glove product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS PROTECTIVE DRIVING GLOVE MEETS THE DRIVING GLOVE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.8.1.8 At least the following information shall also be printed legibly on the driving glove product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's glove identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Glove size or size range
- (8) Cleaning precautions

5.8.2 User Information.

5.8.2.1 The protective driving glove manufacturer shall provide at least the user information that is specified in 5.8.2.5 with each driving glove pair.

5.8.2.2 The protective driving glove manufacturer shall attach the required user information or packaging containing the user information to the driving glove pair in such a manner that it is not possible to use the driving gloves without being aware of the availability of the information.

5.8.2.3 The required user information or packaging containing the user information shall be attached to the driving glove pair so that a deliberate action is necessary to remove it. The protective driving glove manufacturer shall provide notice that the user information is to be removed **ONLY** by the end user.

5.8.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.8.2.5 The protective driving glove manufacturer shall provide at least the following instructions and information with each driving glove pair:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Glove marking recommendations and restrictions
 - (d) A statement that most performance properties of the glove cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use driving gloves that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
- (7) Retirement and disposal criteria and considerations

5.8.2.6 The manufacturer shall make available to prospective purchasers and the purchaser a chart illustrating the hand dimension ranges specified in 6.3.5.

5.9 Load-Carrying Equipment.

5.9.1 Product Label Requirements.

5.9.1.1 The load-carrying assembly and each detachable load-carrying item shall have a product label or labels permanently and conspicuously attached.

5.9.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.9.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required.

5.9.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high. The label, symbol, or identifying mark shall be at least 6 mm ($\frac{1}{4}$ in.) in height and shall be placed in a conspicuous location.

5.9.1.5 All worded portions of the required product label shall be printed at least in English.

5.9.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.9.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING LOAD-CARRYING EQUIPMENT MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

5.9.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Size
- (8) Cleaning precautions

5.9.2 User Information.

5.9.2.1 The load-carrying equipment manufacturer shall provide at least the user information that is specified in 5.9.2.5 with each load-carrying equipment item.

5.9.2.2 The load-carrying equipment manufacturer shall attach the required user information or packaging containing the user information to the load-carrying equipment in such a manner that it is not possible to use the load-carrying equipment without being aware of the availability of the information.

5.9.2.3 The required user information or packaging containing the user information shall be attached to the load-carrying equipment so that a deliberate action is necessary to remove it. The load-carrying equipment manufacturer shall provide notice that the user information is to be removed **ONLY** by the end user.

5.9.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or replace worded statements or user information where explanations for symbols and pictorial graphic representations are provided.

5.9.2.5 The load-carrying equipment manufacturer shall provide at least the following instructions and information with each item:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Load-carrying equipment marking recommendations and restrictions
 - (d) Warranty information

- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

N 5.10 Fire Shelters.

N 5.10.1 Product Label Requirements.

N 5.10.1.1 The fire shelter and fire shelter package shall have a product label or labels permanently and conspicuously attached.

N 5.10.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

N 5.10.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required.

N 5.10.1.4 The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

N 5.10.1.5 All worded portions of the required product label shall be printed at least in English.

N 5.10.1.6 Symbols and other pictorial representations shall be permitted to be used to supplement or replace worded statements on the product label(s) where explanations for symbols and pictorial representations are provided in the user information.

N 5.10.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

THIS WILDLAND AND URBAN INTERFACE FIRE SHELTER MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL!

N 5.10.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Size

N 5.10.2 User Information.

N 5.10.2.1 The fire shelter manufacturer shall provide at least the user information that is specified in 5.10.2.5 with each fire shelter.

N 5.10.2.2 The fire shelter manufacturer shall attach the required user information or packaging containing the user information to the fire shelter in such a manner that it is not possible to use the fire shelter without being aware of the availability of the information.

N 5.10.2.3 The required user information or packaging containing the user information shall be attached to the load-carrying equipment so that a deliberate action is necessary to remove it. The fire shelter manufacturer shall provide notice that the user information is to be removed only by the end user.

N 5.10.2.4 Symbols and other pictorial representations shall be permitted to be used to supplement or replace worded statements or user information where explanations for symbols and pictorial representations are provided.

N 5.10.2.5 The load-carrying equipment manufacturer shall provide at least the following instructions and information with each item:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Fire shelter recommendations and restrictions
 - (d) Sizing requirement
 - (e) Recommended storage practices
 - (f) Warranty information
- (2) Preparation for use
 - (a) Preparing site for deployment
 - (b) Removing fire shelter from packaging
 - (c) Covering oneself independently
 - (d) Any other important instructions
- (3) Inspection frequency and details
- (4) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (5) Retirement and disposal criteria and considerations

Chapter 6 Design Requirements

6.1 Protective Garment Item Design Requirements.

6.1.1 Protective garment items shall have at least the applicable design requirements specified in this section where inspected by the certification organization as specified in Section 4.3.

6.1.2 All collars on jackets, shirts, and one-piece protective garments shall remain upright after extension into a vertical position.

6.1.3 Jackets, shirts, and one-piece protective garments shall not have turn-up cuffs. Sleeve cuffs shall have a closure system that can be adjusted to provide a snug and secure fit around the wrist while wearing a glove that is compliant with the glove requirements of this standard.

6.1.4* Where provided, all pockets that open to the exterior of protective garments, other than front waist pockets, shall have a cover or closure system.

6.1.5 Any pass-through openings in protective garments shall have a means of fastening them in a closed position.

6.1.6 Bottoms of upper torso protective garments, other than cold weather outerwear, shall be designed so that the bottom edge conforms to the respective front and back lengths specified in Table 6.1.14.6(a). No portion of the bottom garment edge shall be less than the respective minimum front and back length measurement. This requirement shall not apply to cold weather outerwear.

6.1.6.1 With an upper torso garment, other than cold weather outerwear, prepared as specified in 6.1.14, a line shall be formed between the two lowest points on the garment bottom edge. Minimum front and back lengths shall extend to that line as a minimum.

6.1.7 All thread used to manufacture garments shall be made of inherently flame-resistant fiber.

6.1.8 All garments that encompass the neck area shall have a closure system at the neckline.

6.1.9 Closure systems shall not come into direct contact with the body.

6.1.10 Hardware of any garment shall not come into direct contact with the wearer's body.

6.1.11 All garment hardware finish shall be free of rough spots, burrs, or sharp edges.

6.1.12 One-piece garment torso closure systems shall extend from the top of the crotch area to the top of the garment at the neck.

6.1.13* Where visibility markings are used on garments, the visibility markings shall be distributed over the exterior of the garment to provide 360-degree visibility of the wearer. This requirement shall not apply to names, organization identification, and heraldry.

6.1.14 Size Requirements.

6.1.14.1 The requirements of 6.1.14.3 through 6.1.14.7 shall not apply to cold weather outerwear.

6.1.14.2 Cold weather outerwear shall be provided in a minimum of five distinct sizes ranging from chest size 39 through 59 and sleeve length of 775 mm (30 in.) to 900 mm (35 in.).

6.1.14.3 Size requirements for tall sizes for upper torso measurements as specified in Table 6.1.14.6(a) and Table 6.1.14.6(d) shall have an additional 25 mm (1 in.) added to the sleeve length dimension and an additional 38 mm (1½ in.) added to the front and back length dimensions.

6.1.14.4 Garments shall be permitted for sizes midway between those specified, provided that they meet dimensional requirements that are midway between the respective values for corresponding even sizes specified in Table 6.1.14.6(a) through Table 6.1.14.6(d).

6.1.14.5 Garments shall be permitted to be custom made, provided that the individual is measured for all dimensions cited in the sizing tables and that the garment provides the minimum ease specified in Table 6.1.14.5.

6.1.14.6 Garments shall be closed, laid flat, smoothed, and gently stretched when measured as defined in Section 3.3 and as specified in Section 6.1 and in Figure 6.1.14.6(a) through Figure 6.1.14.6(c).

6.1.14.7 The minimum seam allowance for all major seams shall be at least 10 mm (⅜ in.), and all minor seams shall be at least 6 mm (¼ in.).

6.2 Protective Helmet Item Design Requirements.

6.2.1 Protective helmet items shall have at least the applicable design requirements specified in this section where inspected by the certification organization as specified in Section 4.3.

6.2.2 Protective helmets shall meet as a minimum the requirements for Type 1, Class G helmets as specified in ANSI/ISEA Z89.1, *Industrial Head Protection*.

6.2.3 Protective helmets shall be designed to consist of at least a shell with a brim or peak, a means of absorbing energy, a suspension system with sweatband, a chin strap, a nape device, goggle clips, and retroreflective markings.

6.2.3.1 The brim shall be an integral part of the helmet shell that extends outward around the entire circumference of the shell.

6.2.3.2 The peak shall be part of the helmet shell and shall extend forward over the forehead.

6.2.4 Provisions shall be made for ventilation between the head and the helmet shell.

6.2.5 All protective helmet materials used in the helmet construction that are designed to come in contact with the wearer's head or skin shall be known to be nonirritating to normal skin.

Table 6.1.14.5 Ease

Dimension	Amount of Ease (in.)	
	Men's Garments	Women's Garments
Upper torso garment		
Neck circumference	+1	+1
Chest circumference	+6	+6
Hip circumference	+6	+6
Bottom circumference	+6	+6
Cuff circumference	+6	+6
Amount of front and back length extending below top of hip line	+6	+6
Lower torso garment		
Waist circumference	+1	+1
Seat circumference	+6	+7
Thigh circumference	+6	+6
Knee circumference	+6	+6
Bottom circumference	+11	+11
Rise (front and back)	+6	+11
One-piece garment		
Neck circumference	+1	+1
Chest circumference	+6	+6
Cuff circumference	+6	+6
Seat circumference	+6	+7
Thigh circumference	+6	+6
Knee circumference	+6	+6
Bottom circumference	+11	+11
Vertical circumference	+10	+10

Note: To convert measurements to millimeters, multiply by 25.4.

Table 6.1.14.6(a) Minimum Sizing Requirements for Protective Upper Torso Garments (in.)

Dimension Measured*	Garment Size						Amount of Change†
	XS	S	M	L	XL	2XL	
Collar length (A)	14 ³ / ₄	15 ³ / ₄	16 ³ / ₄	17 ³ / ₄	18 ³ / ₄	19 ³ / ₄	1
Collar width (B)	3	3	3	3	3	3	0
Front length (C)	24 ³ / ₄	25 ³ / ₄	26 ³ / ₄	27 ³ / ₄	28 ³ / ₄	29 ³ / ₄	1
Back length (D)	28	29	30	31	32	33	1
Sleeve length (E)	30 ¹ / ₂	31 ¹ / ₂	32 ¹ / ₂	33 ¹ / ₂	34 ¹ / ₂	35 ¹ / ₂	1
Sleeve cuff circumference (F)	12	12 ¹ / ₂	13	13 ¹ / ₂	14	14 ¹ / ₂	¹ / ₂
Chest circumference (G)	39	43	47	51	55	59	4
Waist circumference (H)	33	37	41	45	49	53	4
Bottom circumference (I)	38	42	46	50	54	58	4

Note: To convert measurements to millimeters, multiply by 25.4.

*Letters in parentheses refer to Figure 6.1.14.6(a).

†The amount of change between two consecutive garment sizes for the dimension measured.

Table 6.1.14.6(b) Minimum Sizing Requirements for Men's Lower Torso Protective Garments (in.)

Dimension Measured*	Garment Size								Amount of Change†
	26	28	30	32	34	36	38	40	
Waist circumference (A)	26	28	30	32	34	36	38	40	2
Seat circumference (B)	37	39	41	43	45	47	49	51	2
Thigh circumference (C)	25	26	27	28	29	30	31	32	1
Knee circumference (D)	17 ¹ / ₂	18 ³ / ₄	19	19 ³ / ₄	20 ¹ / ₂	21 ¹ / ₄	22	22 ³ / ₄	³ / ₄
Leg cuff circumference (E)	15 ¹ / ₂	16	16 ¹ / ₂	17	17 ¹ / ₂	18	18 ¹ / ₂	19	¹ / ₂
Front rise (F)	9 ⁷ / ₈	10 ³ / ₁₆	10 ¹ / ₂	10 ¹³ / ₁₆	11 ¹ / ₈	11 ⁷ / ₁₆	11 ³ / ₄	12 ¹ / ₁₆	⁵ / ₁₆
Back rise (G)	15 ³ / ₈	15 ¹¹ / ₁₆	16	16 ⁵ / ₁₆	16 ⁵ / ₈	16 ¹⁵ / ₁₆	17 ¹ / ₄	17 ⁹ / ₁₆	⁵ / ₁₆
Inseam length (H)	Cut to order or provided in 1 in. increments between 28 and 36 in.								

Note: To convert measurements to millimeters, multiply by 25.4.

*Letters in parentheses refer to Figure 6.1.14.6(b).

†The amount of change between two consecutive garment sizes for the dimension measured.

Table 6.1.14.6(c) Minimum Sizing Requirements for Women's Lower Torso Protective Garments (in.)

Dimension Measured*	Garment Size								Amount of Change†
	25	27	29	31	33	35	37	39	
Waist circumference (A)	25	27	29	31	33	35	37	39	2
Seat circumference (B)	37	39	41	43	45	47	49	51	2
Thigh circumference (C)	25	26	27	28	29	30	31	32	1
Knee circumference (D)	17 ³ / ₄	18 ¹ / ₂	19 ¹ / ₄	20	20 ³ / ₄	21 ¹ / ₂	22 ¹ / ₄	22 ³ / ₄	³ / ₄
Leg cuff circumference (E)	15	15 ¹ / ₂	16	16 ¹ / ₂	17	17 ¹ / ₂	18	18 ¹ / ₂	¹ / ₂
Front rise (F)	8 ⁷ / ₈	9 ³ / ₁₆	9 ¹ / ₂	9 ¹³ / ₁₆	10 ¹ / ₈	10 ⁷ / ₁₆	10 ³ / ₄	11 ¹ / ₁₆	⁵ / ₁₆
Back rise (G)	14 ⁷ / ₈	15 ³ / ₁₆	15 ¹ / ₂	15 ¹³ / ₁₆	16 ¹ / ₈	16 ⁷ / ₁₆	16 ³ / ₄	17 ¹ / ₁₆	⁵ / ₁₆
Inseam length (H)	Cut to order or provided in 1 in. increments between 28 and 36 in.								

Note: To convert measurements to millimeters, multiply by 25.4.

*Letters in parentheses refer to Figure 6.1.14.6(b).

†The amount of change between two consecutive garment sizes for the dimension measured.

Table 6.1.14.6(d) Minimum Sizing Requirements for Protective One-Piece Garments (in.)

Dimension Measured*	Garment Size					Amount of Change†
	XS	S	M	L	XL	
Collar length (A)	14¾	15¾	16¾	17¾	18¾	1
Collar width (B)	3	3	3	3	3	0
Sleeve length (C)	30½	31½	32½	33½	34½	1
Sleeve cuff circumference (D)	12½	13	13½	14	14½	½
Chest circumference (E)	32	36	40	44	48	4
Seat circumference (F)	37	41	45	49	53	4
Thigh circumference (G)	25	27	29	31	33	2
Knee circumference (H)	17½	19	20½	22	23½	1½
Leg cuff circumference (I)	17½	18½	19½	20½	21½	1
Vertical circumference (J)						
S (short size)	—	—	69	71½	74	—
R (regular size)	63½	63½	71	73½	76	—
T (tall size)	65½	65½	73	75½	78	—
Height range						
S (short size)	—	—	64–67	—	—	—
R (regular size)	63–66	—	67½–72	—	—	—
T (tall size)	66½–69	—	72½–75	—	—	—

Note: To convert measurements to millimeters, multiply by 25.4.

*Letters in parentheses refer to Figure 6.1.14.6(c).

†The amount of change between two consecutive garment sizes for the dimension measured.

6.2.6 The protective helmet — complete with energy-absorbing system, suspension system with sweatband, chin strap, nape device, goggle clips, and visibility markings — shall not weigh more than 570 g (20 oz).

6.2.7 The area under the peak or the front of the brim of the protective helmet shall be permitted to be covered only with a nonconducting, nonflammable, antiglare material.

6.2.8 Clips for headlamps or goggles shall be permanently attached with at least one clip at the rear of the protective helmet and at least one clip on each side of the helmet. Clips shall be suitably located to retain straps and shall not be attached more than 55 mm (2¼ in.) above the lowest point of the helmet dome, excluding the brim.

6.2.9 The protective helmet suspension shall contain a nape device that shall be removable and replaceable.

6.2.9.1 The suspension shall be adjustable in ⅛ hat size or smaller increments.

6.2.9.2 There shall be sufficient clearance between the shell and the suspension to provide ventilation with the suspension adjusted to the maximum designated size.

6.2.10 The protective helmet shall be provided with a sweatband that shall cover at least the forehead portion of the suspension system. Sweatbands shall be either removable and replaceable or integral with the suspension.

6.2.11 The protective helmet shall be designed so that the distance between the top of the head and the underside of the shell cannot be adjusted to less clearance than the manufacturer's requirements for that specific helmet.

6.2.12 Chin straps shall be provided that attach to the helmet. Both chin and nape straps shall not be less than 13 mm (½ in.) in width.

6.2.13 All thread used to manufacture helmets, excluding that used on the crown straps, shall be made of inherently flame-resistant fiber.

6.2.14 Helmets shall not have any metal hardware permanently mounted to the outer surface of the helmet shell.

6.2.15 All helmets shall have retroreflective markings on the exterior of the shell.

6.2.15.1 A minimum of 2580 mm² (4 in.²) of retroreflective markings shall be visible when the helmet is viewed from the sides, front, and rear.

6.2.15.2 The retroreflective markings shall be placed above the goggle or headlamp clips so as not to be obscured by any clip or by the strap retained by the clips.

6.3 Protective Work Glove Item Design Requirements.

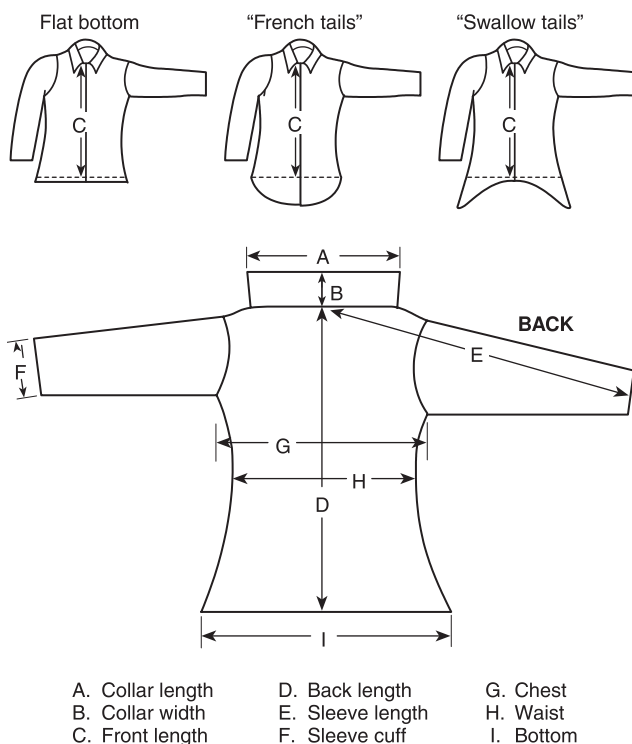
6.3.1 Protective work glove items shall have at least the applicable design requirements specified in this section where inspected by the certification organization as specified in Section 4.3.

6.3.2 Gloves shall consist of a composite meeting the performance requirements of Section 7.3.

6.3.2.1 The composite shall be permitted to be configured as a continuous or joined single layer or as continuous or joined multiple layers.

6.3.2.2 Where a glove is made up of multiple layers, all layers shall be individually graded per size.

6.3.3 The glove shall consist of a glove body. Protective work gloves shall be designed so they closely conform to the wrist or are adjustable at the wrist.



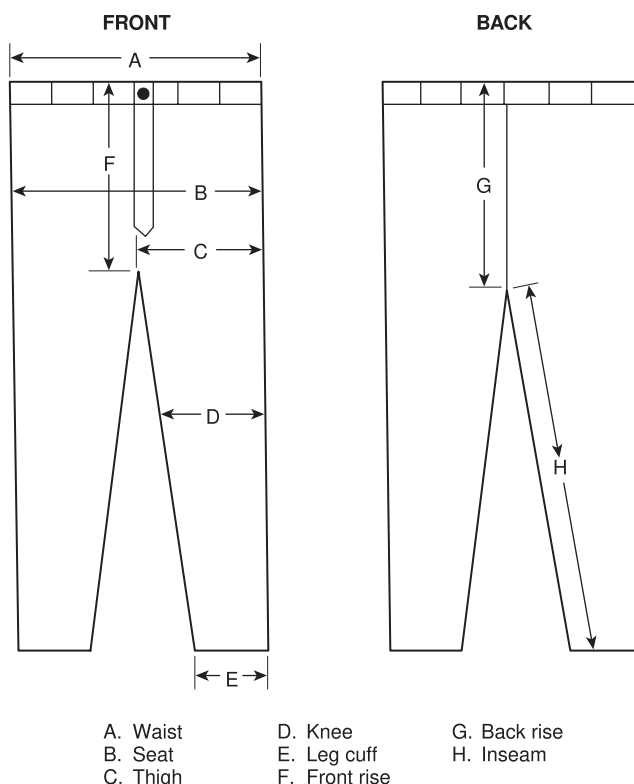
- A. Collar Length. Upper torso garment measurement along top of collar from point-to-point.
 B. Collar Width. Upper torso garment measurement at center back from top edge of unfolded collar to bottom collar seam.
 C. Front Length. Upper torso garment measurement from bottom collar seam to bottom edge of garment at front edge.
 D. Back Length. Upper torso garment measurement at center back from bottom of collar to bottom edge of garment.
 E. Sleeve Length. Upper torso garment measurement from center back at bottom of collar seam diagonally across back and down sleeve to bottom edge of cuff. In other specified instances, it is a measurement from center sleeve setting seam at shoulder to bottom edge of sleeve.
 F. Sleeve Cuff Circumference. Measurement of shirt cuff at end of sleeve from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 G. Chest Circumference. Measurement of upper torso garment from folded edge to folded edge, at base of armholes, and multiplied by 2 to obtain circumference.
 H. Waist Circumference. A garment measurement from top edge of waistband from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 I. Bottom Circumference. Measurement of upper or lower torso garment along bottom edge of garment from folded edge to folded edge, and multiplied by 2 to obtain circumference.

▲ FIGURE 6.1.14.6(a) Upper Torso Measurements [to be used with Table 6.1.14.6(a)].

6.3.3.1 The glove shall extend from the tip of the fingers to at least 25 mm (1 in.) beyond the wrist crease.

6.3.3.2 The portion of the glove that extends from the tip of the fingers to 25 mm (1 in.) beyond the wrist crease shall be considered the glove body and shall meet the glove body requirements in Section 7.3.

6.3.3.3 Where present, the portion of the glove that extends from 25 mm (1 in.) beyond the wrist crease up to the end of

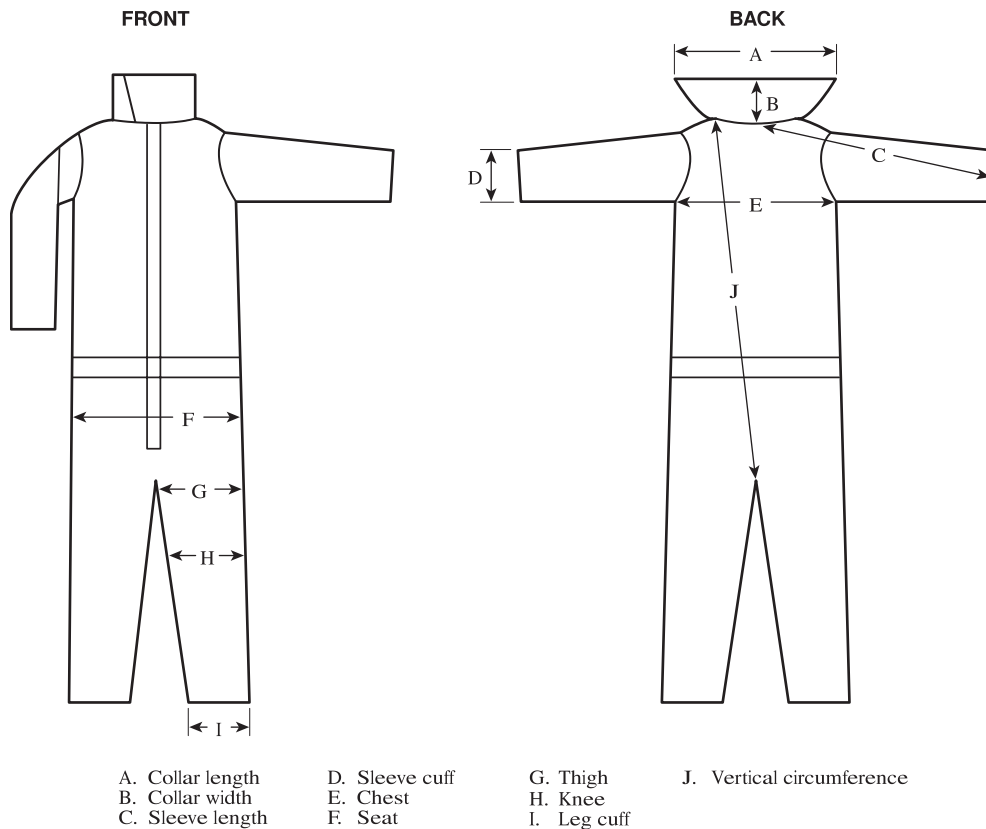


- A. Waist Circumference. A garment measurement from top edge of waistband from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 B. Seat Circumference. Lower torso garment measurement 25 mm (1 in.) above the intersection of seat, front, and inseams from folded edge to folded edge, multiplied by 2 to obtain circumference. In the case of no intersection of seams, mark the garment where the medial line of the trouser legs meets the midsection line of the front and rear panels.
 C. Thigh Circumference. Lower torso garment measurement from the intersection of seat, front, and inseams to lateral folded edge, multiplied by 2 to obtain circumference. In the case of no intersection of seams, mark the garment where the medial line of the trouser legs meets the midsection line of the front and rear panels.
 D. Knee Circumference. Lower torso garment measurement 355 mm (14 in.) below crotch seam, from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 E. Leg Cuff Circumference. Measurement of pant leg cuff along bottom of opening from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 F. Front Rise. Lower torso garment measurement from crotch seam to top of waistband at front center.
 G. Back Rise. Lower torso garment measurement from crotch seam to top of waistband at back center.
 H. Inseam Length. Lower torso garment measurement along inseam from crotch seam to bottom edge of cuff.

N FIGURE 6.1.14.6(b) Lower Torso Measurements [to be used with Table 6.1.14.6(b) and Table 6.1.14.6(c)].

the entire glove shall be considered the glove interface component and shall meet the glove interface component requirements in Section 7.3.

6.3.3.4 The location of the wrist crease shall be determined by first placing the glove on a measurement board palm down and securing (locking) the fingertips to the board.



- A. Collar Length. Measurement along top of collar from point-to-point.
 B. Collar Width. Measurement at center back from top edge of unfolded collar to the bottom collar seam.
 C. Sleeve Length. Measurement from center back at bottom of collar seam diagonally across back and down sleeve to bottom edge of cuff. In other specified instances, it is a measurement from center sleeve setting seam at shoulder to bottom edge of sleeve.
 D. Sleeve Cuff Circumference. Measurement of shirt cuff at the end of the sleeve from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 E. Chest Circumference. Measurement of upper torso garment from folded edge to folded edge, at base of armholes, and multiplied by 2 to obtain circumference.
 F. Seat Circumference. Measurement from 25 mm (1 in.) above bottom of fly curve from folded edge to folded edge, multiplied by 2 to obtain circumference.
 G. Thigh Circumference. Measurement at crotch line from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 H. Knee Circumference. Measurement 355 mm (14 in.) below crotch seam, from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 I. Leg Cuff Circumference. Measurement of pant leg cuff along bottom of opening from folded edge to folded edge, and multiplied by 2 to obtain circumference.
 J. Vertical Circumference. With garment laid flat, measure between either collar seam to crotch and multiplied by 2 to obtain circumference.

▲ FIGURE 6.1.14.6(c) One-Piece Garment Torso Measurements [to be used with Table 6.1.14.6(d)].

6.3.3.4.1 A 1 lb weight shall be attached to the end of the glove body or glove interface component. The weight shall not be attached to a knitted wristlet glove interface component. The weight shall be applied evenly across the glove.

6.3.3.4.2* Two points shall be marked on the back side of the glove. The location of the points shall be determined by measuring down the following distances, which are provided according to glove size, from the finger crotch of digit two and from the finger crotch of digit three:

- (1) XS: 9.46 cm (3.72 in.)
- (2) S: 10.04 cm (3.95 in.)
- (3) M: 10.68 cm (4.20 in.)
- (4) L: 11.21 cm (4.42 in.)
- (5) XL: 11.73 cm (4.62 in.)

6.3.3.4.3 A straight line shall be drawn on the back side of the glove using the two points. This line shall be drawn around the side edges of the glove.

6.3.3.4.4 The glove shall be removed from the measurement board. A line shall be drawn on the palm side of the glove by connecting the lines from the side edges of the glove.

6.3.3.4.5 The resulting straight line around the circumference of the glove shall be the location of the wrist crease.

6.3.4 All thread used to manufacture protective work gloves shall be made of inherently flame-resistant fiber.

• 6.3.5 Hand dimensions for the selection of the proper protective work glove size shall consist of measuring the hand circumference and hand length dimensions as shown in Table 6.3.5.